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10/029,961	12/31/2001	Jai-young Kim	030681-349	5416

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EXAMINER
FALASCO, LOUIS V

ART UNIT	PAPER NUMBER
1773	4

DATE MAILED: 04/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Offic Action Summary	Application No. 10/029,961	Applicant(s) KIM, JAI-YOUNG	
	Examin r Louis Falasco	Art Unit 1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 to 15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 to 15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

PAPERS RECEIVED

Applicants Pre examination Amendment received 12/31/01

1. Priority Papers received 12/31/01, however it is noted that this is more than a year. The filing date of the foreign priority document is not the effective filing date.

- Acknowledgment is made of applicant's claim for priority under 35 U.S.C. 119(a)-(d) based upon an application filed in The Republic of Korea on 12/29/00. A claim for priority under 35 U.S.C. 119(a)-(d) cannot be based on this application, since the United States application was filed more than twelve months thereafter.

There is no Information Disclosure Statement.

CLAIMS

The claims are 1 to 15.

All claims are under consideration.

ACTIONS

Statutory Basis

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Rejections

1. Claims 1 to 15 are rejected under 35 U.S.C. 102(b) as anticipated by **Lal et al** (US 5576085).

The instant claims call for a perpendicular recording disk including an under layer between a substrate and perpendicular magnetic recording layer. The perpendicular magnetic recording layer has a thickness in a range where a ratio of the perpendicular coercivity - to - maximum perpendicular coercivity decreases with reduced thickness. The thickness of the layers are such that the relationship of perpendicular coercivity - to

- maximum perpendicular coercivity. This is obtained by the thickness of the perpendicular layer being in a range of 20 – 50 nm. The range taught in **Lal et al** is wholly that which would result in the claimed properties. **Lal et al** teaches the range of thickness to obtain the relationships, and the compositions of dependent claims **5, 6, 7**.

In **Lal et al** see the *CoCr* alloys of **Lal et al** magnetic thin film 16 and note **Lal et al** col. 4 lines 52 – 65, showing a layer thickness of 10 to 80 nm and underlayer col. 7 ln 38 - 40.

In dependent claim **2** and in further dependent claims **8, 9, 10** the recording disk contains a soft magnetic layer with thickness of the layers as such that the rate of variation of the ratio of perpendicular remanent magnetization - to - maximum perpendicular magnetization, and further have a composition which includes *NiFe* alloyed with any of: *Nb, V, Ta, Zr, Hf, Ti, B, Si, P* in a thickness between 3 – 30 nm.

In **Lal et al** *NiFe alloys* of the **Lal et al** magnetic thin film 18 col. 4 line 66 to col. 5 line 10, having a layer thickness of 1 to 10 nm.

As to the protective, lubricating layer of dependent claim **12**:

In **Lal et al** note layer film 130 col. 11 lns 24, 25.

2. Claims 1 to 15 are rejected under 35 U.S.C. 102(e) as anticipated by either **Ikeda** (US 2001/0019786) or **Futamoto et al** (US 2002/0055020).

The instant claims call for a perpendicular recording disk which include an under layer between a substrate and a perpendicular magnetic recording layer. The perpendicular magnetic recording layer has a thickness in a range where a ratio of the perpendicular coercivity - to - maximum perpendicular coercivity decreases with reduced thickness. The thickness of the layers are such that the relationship of perpendicular coercivity - to - maximum perpendicular coercivity. This is obtained by the thickness of the perpendicular layer being in a range of 20 – 50 nm. In dependent **claims 5, 6, 7** the composition is *CoCr* alloyed with any of: *B, Pt, Ta, Nb, Zr, Y, Mo.*

Futamoto et al teaches the range of thickness and the compositions of claims **5, 6, 7**.

> In **Futamoto et al** see the *CoCr* alloys of the **Futamoto et al** perpendicular magnetic thin film 13 and of *CoCr* alloys paragraph [0010], having a layer thickness of 25 nm paragraph [0076] or 30 nm paragraph [0081] and underlayer 12. See the examples of **Futamoto et al** of paragraphs 0110 and 0111 where examples show the layer up to 30 nm and specifically of 20 nm thick and the magnetic film chiefly Co and containing Cr the thickness of magnetic films 103 and 105 30 nm and 20 nm respectively.

In dependent claim **2** and in further dependent claims **8, 9, 10** the recording disk also contains a soft magnetic layer and the thickness of the layers as such that the rate of variation of the ratio of perpendicular remanent magnetization - to - maximum perpendicular magnetization and have a composition which includes *NiFe* alloyed with any of: *Nb, V, Ta, Zr, Hf, Ti, B, Si, P* in a thickness between 3 – 30 nm.

In **Ikeda** Fig. 2 soft magnetic layers - any of layers 5/7/9/11/12 - see **Ikeda** paragraph [0026] where the permeability (μmax) of the magnetic layer is related to the thickness of the layer - see **Ikeda** paragraphs [0034] - [0035].
In **Futamoto et al** note the *CoCr* alloys of the **Futamoto et al** soft magnetic thin layer 42 paragraph [0080] having a layer thickness of 30 nm paragraph [0085], paragraph [0089], or from 7 to 100nm - page 7 col. 2.

As to the protective, lubricating layer of dependent claim **15**:

In **Futamoto et al** note layer film 15, paragraph [0085].

3. Claims 1 to 14 are rejected under 35 U.S.C. 102(e) as anticipated by **Ikeda** (US 2001/0019786).

The instant claims call for a perpendicular recording disk including an under layer between a substrate and perpendicular magnetic recording layer. The perpendicular magnetic recording layer has a thickness in a range where a ratio of the perpendicular coercivity - to - maximum perpendicular coercivity decreases with reduced thickness. The thickness of the layers are such that the relationship of perpendicular coercivity - to - maximum perpendicular coercivity. This is obtained by the thickness of the perpendicular layer being in a range of 20 - 50 nm. . In dependent **claims 5, 6, 7** the composition is *CoCr* alloyed with any of: *B, Pt, Ta, Nb, Zr, Y, Mo.*
Ikeda teaches the range of thickness and the compositions of claims **5, 6, 7**.

In **Ikeda** see Fig. 2 where magnetic layer 4 of *CoCr* alloy has a layer thickness of 5 to 50 nm - note **Ikeda** paragraph [0039] and interlayer paragraph [0040]. See the examples - example 1, paragraph [0039] has a thickness 30 nm and see table 1 illustrating the examples of **Ikeda** show the structure within the claimed range providing the properties of the instant claims.

In dependent claim **2** and in further dependent claims **8, 9, 10** the recording disk also contains a soft magnetic layer and the thickness of the layers as such that the rate of variation of the ratio of perpendicular remanent magnetization - to - maximum perpendicular magnetization and have a composition which includes *NiFe* alloyed with any of: *Nb, V, Ta, Zr, Hf, Ti, B, Si, P* in a thickness between 3 - 30 nm.

In **Ikeda** Fig. 2 soft magnetic layers - any of layers 5/7/9/11/12 - see **Ikeda** paragraph [0026] where the permeability ($u$max) of the magnetic layer is related to the thickness of the layer - see **Ikeda** paragraphs [0034] - [0035].

The claiming new function or previously unknown property, inherently present in the prior art, does not necessarily make the claims patentable. *In re Best, 562 F.2d 1252, 1254, 195 USPQ 430, 433* (CCPA 1977).

It has been held that where claimed and prior art products are substantially identical in structure or composition a case of anticipation or a prima facie case of obviousness has been established.

The burden of proof is shifted to applicant to show that the prior art products do not necessary or inherently posses the characteristic of a claimed product whether the

rejection is based upon "inherency" under 35 USC 102 or on "prima facie obviousness" under 35 USC 103 jointly or alternately. *In re Best 562 F2d 1252, 1255, 195 USP 430, 433 (CCPA 1977).*

4. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Ikeda** taken with the admitted state of the prior art.

Ikeda does not specify including the protective of dependent claim **15**. However this is a admittedly conventionally included as pointed out in the admissions in reverences to Figs 1 & 2 see instant layer 14.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to adopt the admittedly conventional protective layer in the element of **Ikeda** the purpose of protecting the recording layer from external impact. One skilled in the art would have been motivated to adopt the admissions of prior art protection layer with the expectation of shielding the recording media see admissions page- -2- lines 8 to 10. One of ordinary skill would have been motivated to provide the protective layer in order to defend the recoding layers from damage.

OTHER REFERENCES

Kiuchi et al (US 5589262) is cited as being of interest showing perpendicular and soft magnetic layers within the range of 4 m*u*m - 20 m*u*m.

Chen (US 6475611) is cited as being of interest showing very small layers of soft & perpendicular magnetic film in a superlattice structure.

Lambeth et al (US 6248416) is cited as being of interest showing perpendicular and soft magnetic film, CoCr film in the range of 2.5 – 60 nm.

Tanahashi et al (US 59222456) is cited as being of interest showing a three layer structure magneto restive films of less than 20 nm thickness.

Wang et al (Wang et al Effects of Thin Cr IEEE Transactions on Magnetics Vol. 34, No. 4 July 1998) is cited as being of interest showing decressed magnetic anisotropy with increased layer thickness.

CONCLUSION

The claims are 1 to 15 have been considered.

- No claim has been allowed.

INQUIRES

Any inquiry concerning this communication from the examiner should be directed to examiner Louis Falasco, Ph.D. whose telephone number is 703.305-6974. The examiner can normally be reached M-F 9:30 AM - 6:00 PM.

- If attempts to reach the examiner are unsuccessful, the examiner's supervisor, Paul Thibodeau may be reached at 703.308-2367.
- The Fax phone numbers for the organization where this application or proceeding is assigned are: 703.872-9310 for regular communications and 703.872-9311 for After Final communications.

An inquiry of a general nature or relating to status of this application or proceeding should be directed to the TC 1700 receptionist whose telephone number is 703.308-0651.

ZR

LF
04/03

STEVAN A. RESAN
PRIMARY EXAMINER